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PATENT SPECIFICATION

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Div. 58

453,025

Convention Date (United States): Sept. 17, 1934.

Application Date (in United Kingdom): Sept. 16, 1935. No. 25630/35.

(Patent of Addition to No. 440,850: Dated Dec. 18, 1933.)

Complete Specification Accepted: Sept. 3, 1936.



COMPLETE SPECIFICATION

Improvements relating to Sealing Devices for Bottle and like Containers

We, ANCHOR CAP & CLOSURE CORPORATION, a corporation organised and existing under the laws of the State of New York, United States of America, of 22, Queens Street, Long Island City, State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to tamper-proof closures, for bottles and like containers, of the type including a ratchet or equivalent device which permits the ready application of the closure but on its removal causes the fracture of a frangible element which thus indicates that the container has been opened.

The present invention, which is an improvement in or modification of the invention defined in the specification of Letters Patent No. 440,850, consists in a closure of the aforesaid type in which the frangible element is in the form of a structurally separate collar or band and has therein a member locked against relative rotation in at least one direction and provided with one or more resilient tabs or projections bent out of the plane thereof for engaging one or more projections on a cap. The invention also includes certain subsidiary features hereinafter described and claimed and in order that it may be clearly understood reference will now be made to the accompanying drawings in which two constructional forms are illustrated by way of example, and in which:—

Fig. 1 is a fragmentary sectional view of the parts of the seal applied to a container;

Fig. 2 is a sectional view on the line 2-2 of Fig. 1;

Fig. 3 is a side elevational view, partly in section, of the closure cap;

Fig. 4 is an exploded view of the spring member and band in perspective;

Fig. 5 is a sectional view of a stack of assembled spring and band elements;

Fig. 6 is a fragmentary side elevational view of the sealed container;

Fig. 7 is a fragmentary side elevational view of an opened container with the closure applied as a reseal; 55

Fig. 8 is a fragmentary sectional view of another embodiment of the invention;

Fig. 9 is a bottom view illustrating a modification of the band; and

Fig. 10 is a sectional view with parts 60 in elevation, illustrating the preferred method of moulding.

Referring more particularly to the drawings, there is illustrated a preferred embodiment of the present invention comprising a container 1, a closure cap 2 and a frangible band 4 combined with a ratchet member 5. The details of the construction will be described more particularly in the following description of these several parts. 70

The container 1 is preferably a glass bottle or jar having the usual screw thread 6 adjacent the upper end thereof for attaching a sealing closure thereto. 75 The container is also provided with the usual shoulder 7 and has, above the shoulder, a pair of projections 8 adapted to cooperate with the shoulder 7 in seating and breaking the band 4, as will be described hereinafter.

The closure cap is preferably made of moulded material, such as synthetic resins, phenolic condensation products, and the like, although the use of other materials is contemplated. The closure cap preferably has the usual screw thread 9 therein adapted to engage the thread 6 on the container to compress a liner 10 in the cover part of the cap against the rim of the container to seal the container. The liner 10 may be of any desired material, for example cork, felt, rubber, cardboard or the like, which may have a thin layer of oil paper or tin foil 10^r, if desired. A suitable liner retaining ledge 11 may support the liner in the cap during shipment and handling and when the cap is removed from the bottle. The bottom of the skirt of the cap differs from 100

[Price 1/-]

the usual cap in that a series of ratchet projections 12 are provided at the inner part of the bottom of the cap to engage suitable projections on the locking member 5, which will be described herein-after. The outer peripheral part of the bottom of the skirt 14 extends downwardly beyond the bottom of the projections 12. In addition, the cap preferably has a narrow ledge 15 substantially in line with the bottom of the projections 12 and intermediate the projections 12 and the downwardly depending portions 14 of the skirt. The advantage of having the bottom of the skirt constructed in this manner is to protect the projections 12, in the manufacture, handling and shipping of the caps, against breakage and the like. The overhang 14 shields and cooperates with the upper edge of the collar 4 to form an overlapping joint which prevents access to the ratchet member 5 when a container is sealed. In addition, the construction of the cap, as shown, is particularly adapted for moulding, thereby simplifying the manufacture. Caps of this kind may be most easily made, as illustrated in Fig. 10, by stripping the caps 2 from the moulding pin 31, forming the interior of the cap. This may be done while the caps are hot. The elasticity of the material in its hot state directly after moulding permits the threads in the skirt of the cap to jump over the threads on the pin. The stripping operation may be accomplished by a stripping plate 32 which, with the cap as shown, may form the bottom of the portion 14, while the pin 31 may form the interior of the cap, the ratchet members 12 and the ledge 15. The entire exterior of the skirt down to the bottom thereof is formed by an enveloping hob 33. The pin and stripping plate meet preferably at the inner edge of the depending part 14. In this way, the mould parting lines and fins, if any, are confined to portions where they are least objectionable and where they present the least difficulty in removal.

The screw cap, as described above, may be utilized as an ordinary screw cap on the container described or on other containers, both as an original seal and for resealing purposes. However, as with the cap alone there is no insurance against tampering with the container, there is provided a frangible band 4, which is preferably combined with a ratchet member 5. The upper portion of the band may have an upwardly extending part 16 on the inner periphery thereof adapted to fit on the inner periphery of the skirt portion 14 of the cap. These overlapping parts 65 are sufficiently long to prevent anyone

from prying under the skirt of the cap to release the cap locking mechanism. The length of the part 16 should be slightly greater than the maximum variation from a true standard, permitted in the manufacture of the caps and glass containers. The bottom of the band has a recess 17 on the inner part thereof adapted to telescope over the projection 16 so that one band will nest with another to facilitate shipping and handling. The lower inner edge of the band may be bevelled to facilitate the nesting thereof. The lower portion of the band also has a pair of recesses 18 adapted to fit over the projections 8 on the container to hold the band against rotation with respect to the container. One end of each of the recesses 18 is provided with a cam-like surface 19 adapted to cooperate with a similar surface on the projection 8 of the container to break the band 4 in two places, that is, substantially in half, whenever a force is applied to rotate the band with respect to the container. In order to break the band with the least effort in unscrewing, it has been found that the angle of the cam-like surface 19 should be about sixty degrees with respect to the radius at the point. The cam surfaces 21 on the ratchet member 5 and the cam surfaces 8 on the container should have similar angles of inclination to obtain the best results.

The band is operatively connected to 100 the cap to permit rotation with respect thereto for screwing the cap on and to prevent rotation with respect thereto on screwing the cap off. In this way, the cap may be screwed on without any 105 hindrance whatsoever and cannot be screwed off without breaking the band 4, thus indicating that the container has been tampered with. To achieve this result the member 5, preferably metallic, 110 is provided with projections 20 to fit into the recess 18 of the band. These projections 20 likewise, in their preferred form, have cam surfaces 21 which engage the cam surfaces 19 on the band to cooperate 115 with similar cam surfaces on the bottle neck to exert pressure on the band at both the top and bottom thereof to facilitate complete breakage thereof. Preferably, these cam surfaces are about sixty degrees 120 to the radius to obtain best results. Suitable tongues 22 are cut out of the metal member 4 and struck up from the plane of the metal, as shown more particularly in Figs. 4 and 5, to engage the projections 125 or ratchet members 12 on the closure cap. These tongues are sufficiently strong to rotate the band 4, causing the projections 8 on the container and the projections on the member 5 to break the band 4, per 130

mitting it to fall off the container, thereby preventing the container from being resealed without visible indications of its having been opened.

15 If desired, the band 4 may be made as illustrated in Fig. 9, wherein projections or vertical ribs 29, having the cam-like surfaces 19 and the vertical ribs 29' on the inside of the band, lock the band 10 against rotation with respect to the bottle and with respect to the metal member 5. This construction has the advantage of saving material, since the portions 30 intermediate the recesses 18 are thinner.

15 The metal member 5 may be shipped and sold as a separate unit, but preferably is combined with the band 4. The band is provided with projections or bumps 24 in the recesses 18, over which the projections 20 of the metal member may be snapped to hold the metal member firmly in position in the band. The combined metal members and bands may be nested, as shown in Fig. 5, for shipping and 20 handling. The bands and spring members may be assembled in the factory of the cap manufacturer, thus making it much easier for the bottler to assemble the parts, which may be done by hand, 30 it being merely necessary for the operator to pick up a cap in one hand and a combined band and ratchet member in the other hand, place the band on the container and then screw the cap on.

35 It will be understood, however, that these parts may be made and sold separately and the metal member 5 may be made of a mouldable material instead of metal. A construction illustrating 40 this is shown in Fig. 8, wherein a moulded ratchet member 27 is shown in engagement with the ratchet on the cap, the moulded member being held in its upper position by a spring 28. The modified 45 construction will operate efficiently but the spring 28 and ratchet member 27 cannot readily be combined, since it is necessary for the operator to handle four parts, exclusive of the bottle, in sealing 50 the container, whereas with the preferred form it is only necessary to handle two parts, exclusive of the bottle. The operation is otherwise similar to that of the preferred embodiment, the difference 55 being in the construction of the spring and ratchet members and their assembly with the band.

In assembling the device, as pointed out above, the operator applies a combined 60 band and holding member to a filled bottle and thereafter screws the closure cap on in the usual manner, or, if desired, a sealing machine may be used to apply the cap. In removing the cap, the consumer 65 merely unscrews it in the usual manner.

When the cap begins to turn, the cam projections on the member 5 and on the container 1 engage the cam projection on the band 4 to break the band at diametric points so that it falls off the container. 70 The presence of the band in its original form indicates clearly that the container has not been tampered with, and the absence of the band indicates that the container has been opened. So far as sealing is concerned, the cap works equally well with or without the band, although the band locks with the cap against accidental backing off. Fig. 6 illustrates a sealed bottle with the cap on, showing that it has not been tampered with, and Fig. 7 shows the sealed bottle with the cap reapplied for resealing purposes after the band has been broken in opening the container. To make the band more conspicuous and to improve the appearance of the container, the band is usually of a colour which contrasts with the colour of the cap, for example a red band with a black cap. 80

It will be seen that the present invention provides a construction which may be readily manufactured at a low cost.

The construction may also be assembled with a minimum amount of work on the part of the operator and with a minimum cost to the bottler. In addition, the cap is firmly locked in position against backing off, so that there is no danger of the container becoming unsealed during transportation and handling. The cap is also locked against unauthorized opening of the container. Any attempt to remove the cap immediately breaks the band, which is preferably of a different and conspicuous colour, and indicates clearly that the container has been opened. These various advantages have been achieved in an inexpensive and convenient manner and with a minimum 100 number of parts. 105

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we 115 claim is:—

1. A tamper-proof closure of the type stated in which the frangible element is in the form of a structurally separate collar or band and has therein a member locked against relative rotation in at least one direction and provided with one or more resilient tabs or projections bent out of the plane thereof for engaging one or more projections on a cap. 120
2. A tamper-proof closure, according to Claim 1 wherein the said projections are bent upwardly. 125
3. A tamper-proof closure according to either preceding Claim wherein the said 130

member is provided with downwardly extending spring portions adapted to be seated on a shoulder of a container.

4. A tamper-proof closure according to 5 any of the preceding Claims wherein the member has one or more radially outwardly extending portions for locking the member against rotation with respect to the frangible element.

10 5. A tamper-proof closure according to any of the preceding Claims wherein the radially outwardly extending portions have cam portions thereon.

6. A tamper-proof closure according to 15 any of the preceding Claims wherein the member is formed of metal.

7. A tamper-proof closure according to any of the preceding Claims wherein the frangible element has recesses for receiving the outwardly extending portions of 20 the member.

8. A tamper-proof closure, according to Claim 7, wherein the frangible element has relatively small projections at the 25 recesses for retaining the member.

9. A tamper-proof closure, according to Claim 7 or 8, wherein the recesses of the frangible element register with projections on a container to lock the element 30 on the container against rotation.

10. A tamper-proof closure, according to Claim 9, wherein the container projections have cam faces adapted to force the frangible element radially outwardly to break the element when the element is 35 rotated with respect to the container.

11. A tamper-proof closure, according to Claim 9 or 10, wherein the container has screw means for attaching a sealing cap. 40

12. A tamper-proof closure, according to Claim 11, having a screw cap applied to the container.

13. A tamper-proof closure, according to Claim 12, wherein the screw cap has 45 ratchet portions or projections for engaging the projections or tabs of the member.

14. A tamper-proof closure, according to Claim 13, wherein the skirt of the cap extends below the ratchet projections. 50

15. A tamper-proof closure, according to Claims 12 to 14, wherein the cap and indicator element have overlapping portions for preventing access to the ratchet projections of the cap. 55

16. A tamper-proof closure substantially as described with reference to the accompanying drawings.

Dated this 16th day of September, 1935.
MARKS & CLERK.

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SHEET 1

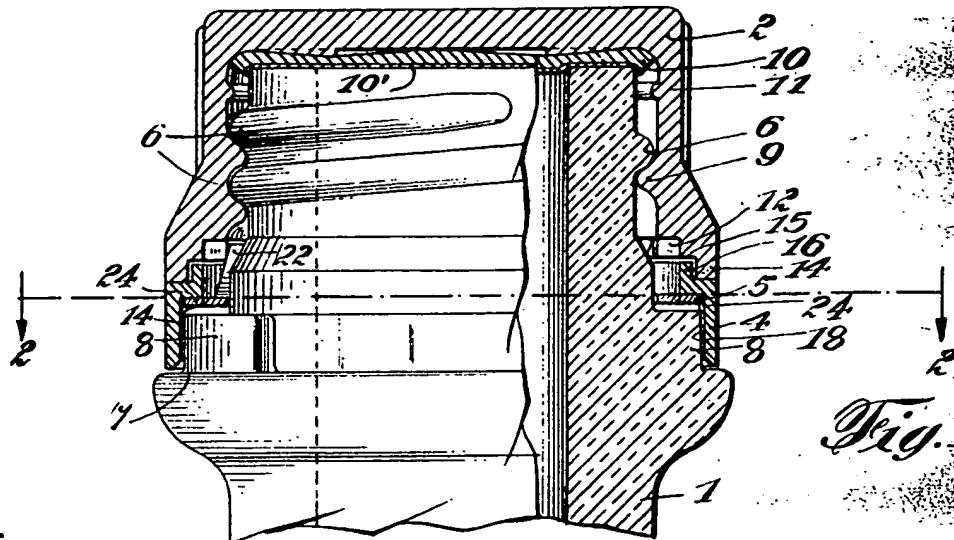


Fig. 1

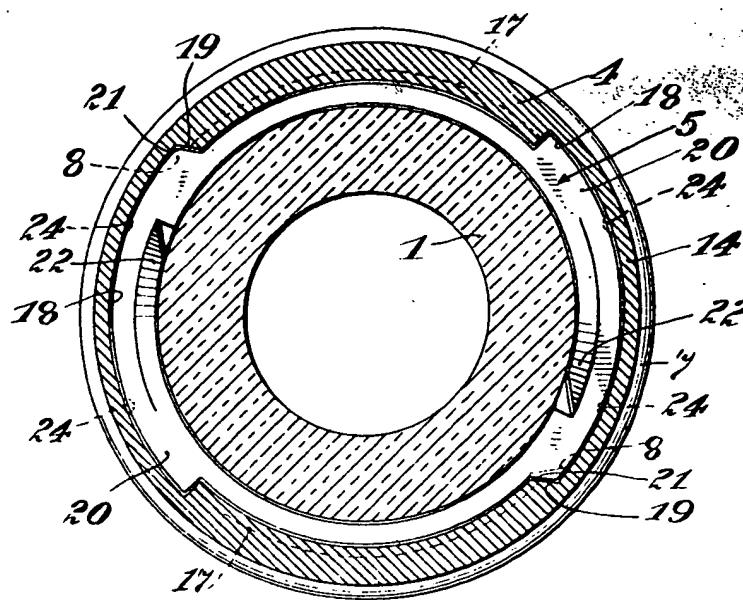


Fig. 2.

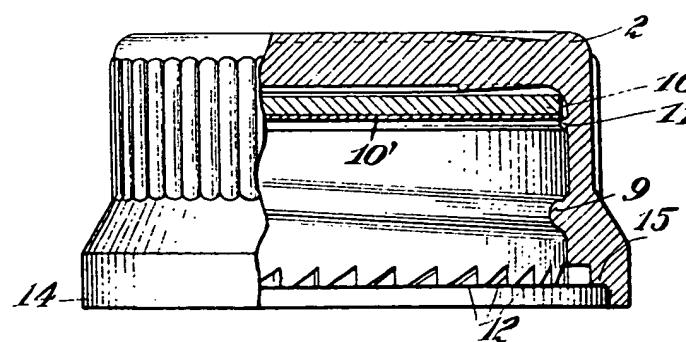


Fig. 3.



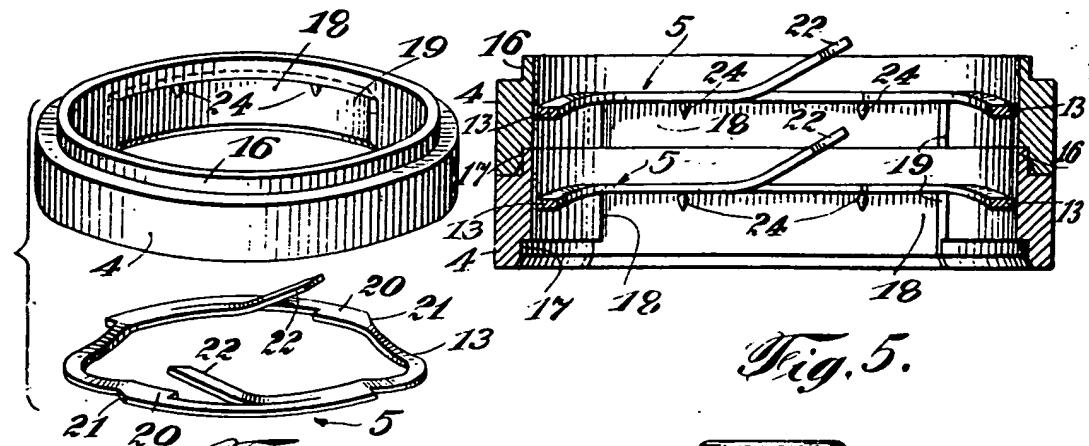


Fig. 4.

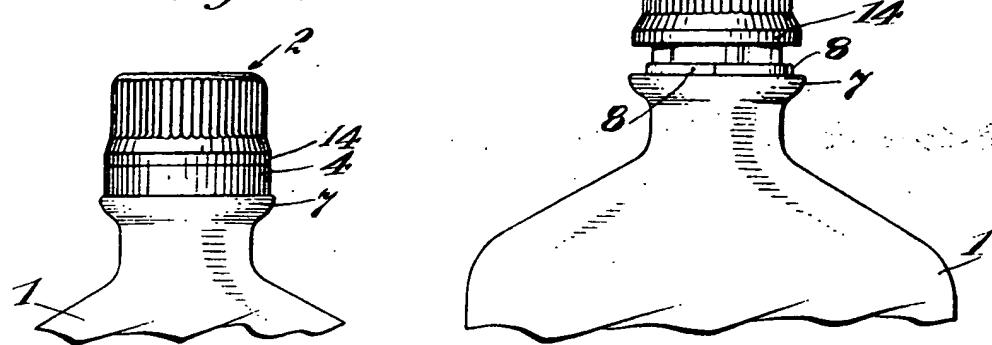


Fig. 6.

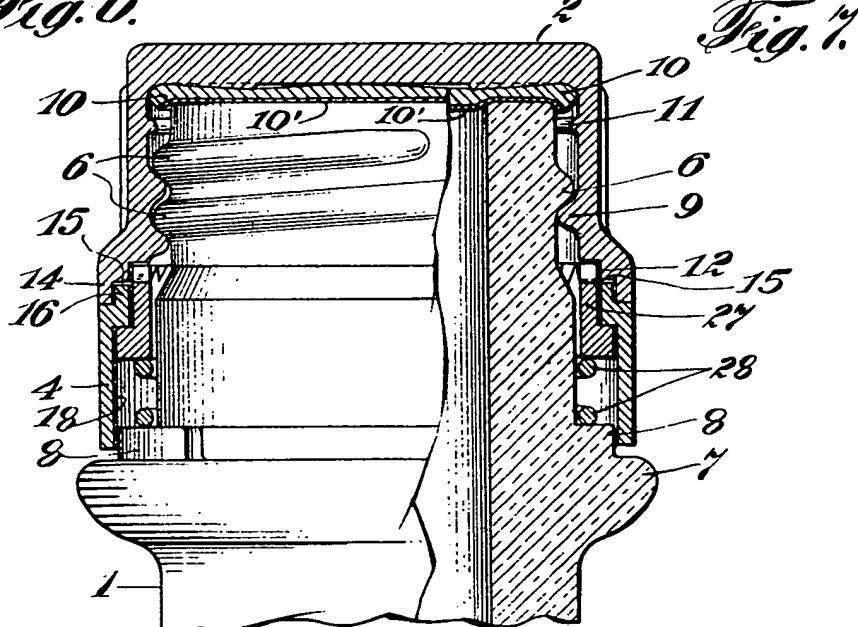


Fig. 8.



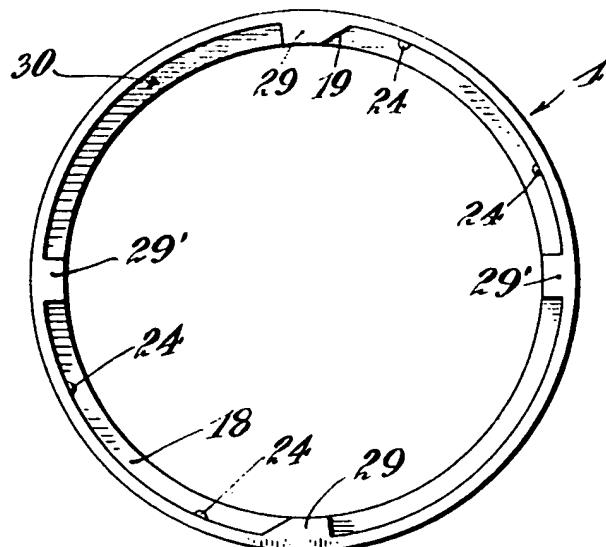


Fig. 9.

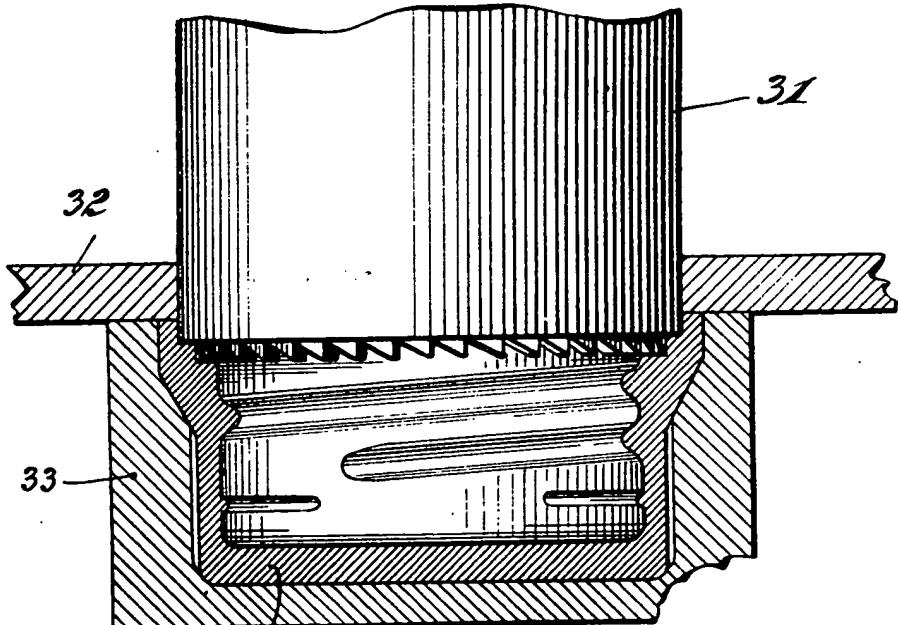


Fig. 10.

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